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NAME *Ministry Subs*

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PROPERTY FILE

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and the raise was driven from No. 10 level to the old Mammoth workings on No. 9 level. This provides access and ventilation to the area below No. 9 level. The main stoping area was between No. 10 level and No. 9 level. Development consisted of 270 feet of drifting and 460 feet of raising. The concentrator, operating on a one-shift basis, treated 3,401 tons of ore during 1961. The average number of men was fourteen, three of whom were employed in the mill.

**Hewitt (Kopan Developments Limited).**—(49° 117° N.E.) Company office, 906, 11 Adelaide Street West, Toronto. W. W. Dennis, president. This property was leased to F. Pho and J. Hichert for two years. The lessees mined on No. 10 level, and the ore was hauled to the Western Exploration concentrator. The total ore treated was 282 tons.

**Galena Farm.**—(49° 117° N.E.) F. Mills, of Silverton, holds a lease on this mine, 2 miles by road south of Silverton. The ore was hauled to the Western Exploration concentrator. The total ore treated was 374 tons.

#### SPRINGER CREEK\*

##### Silver

**Anna (Silver King Mines Limited)** (49° 117° N.E.) This group of five claims is owned by Silver King Mines Limited; mine office, Silverton. B. Marasek, president and manager. The property is on the northern side of Springer Creek, adjoining the Ottawa mine on the east. It is accessible by 5 miles of good road from Slocan City.

Development continued on No. 4 level: Drift extension, 650 feet; crosscutting, 35 feet; raising, 205 feet. One raise was driven 170 feet on the dip to connect with No. 3 level, but was not completed. An average crew of four men was employed for six months. No ore was shipped.

**Ottawa (Ottawa Silver Mines Limited)** (49° 117° N.E.) Company office, 19 North Bernard Street, Spokane, Wash.; mine office, Silverton. T. C. Hughes, president; C. Thickett, mine manager. The option on this property to Skylane Mines Limited was bought back by Ottawa Silver Mines Limited in the spring of 1961. In August the property was optioned to Silver Buckle Mining Company, of Wallace, Idaho. This option was dropped in November after geological examination.

The property is on the north side of Springer Creek, 5 miles by road from Slocan City. All work was done by Ottawa Silver Mines Limited. A small tonnage of ore mined on No. 8 level was shipped to the Trail smelter. A new drift was started, called No. 9 level, to be driven along the Ottawa shear to intersect the downward extension of the vein.

**Arlington (Aumaque Gold Mines Limited)** (49° 117° N.E.) Company office, 1600, 100 Adelaide Street West, Toronto 1; mine office, Slocan City. A. W. Johnson, president; R. C. Phillips, manager. Capital: 10,000,000 shares, \$1 par value. This property consists of five Crown-granted and ten recorded claims and is under option from B. I. Nesbitt, of Vancouver. The property is on the north side of Springer Creek, 6.7 miles by road from Slocan City.

\* By J. D. McDonald.

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The old "A" level of the Arlington mine was rehabilitated by stripping the first 80 feet, which was caved, and retimbering 238 feet of drift. The level was reopened for a length of 700 feet. The portal of "D" level was opened up, and some surface stripping was done. On "A" level eight diamond-drill holes were completed, with a total length of 600 feet. The holes were drilled along the drift at intervals to explore the shear from footwall to hangingwall. Work was completed and all equipment removed by the end of October.

## NAKUSP\*

*Copper***Nadeco**

(50° 117° N.W.) This group of six recorded claims is owned by R. Joy, P. Hurry, R. Jordan, F. Jordan, and H. Murphy, of Nakusp. The claims are 8 miles north of Nakusp, on the new Nakusp-Galena Bay road, 1,000 feet up the hill from the road at an elevation of 1,900 feet. Copper mineralization occurs in narrow shear zones in diorite. Three shears were observed, the widest being 4 feet. A short distance to the west, and down hill from the showings, a limestone bed outcrops and strikes parallel to the strike of the shear zones. Three diamond-drill holes were drilled to a total depth of 144 feet. It was noted that the diorite had pyrite sprinkled through it.

## NORTH LARDEAU\*

## FERGUSON (50° 117° N.E.)

*Copper***New Zone Copper Limited**

Company office, 120 McKenzie Avenue, Revelstoke; mine office, Ferguson. A. E. Peterson, mine manager. Capital: 200,000 shares, no par value. This property is west of the Nettie L and is reached by the Nettie L road, 1½ miles from the road up the south fork of Lardeau Creek. The showing is in schistose siliceous rocks alongside the road at an elevation of about 4,000 feet. The zone appears to strike north 20 degrees west and to dip steeply to the southwest. The vein was sparsely mineralized with pyrite and some chalcopyrite. Two grab samples from surface assayed 0.29 per cent and 0.16 per cent copper, and 0.12 per cent and 0.13 per cent nickel.

A drift was started a short distance below the showing and was driven about 35 feet. The property was closed in November. Four men were employed for a three-month period.

## SOUTH LARDEAU

*Lead-Zinc***Duncan (The Consolidated Mining and Smelting Company of Canada, Limited)\***

(50° 116° S.W.) Company office, Trail. This property consists of fifty-eight Crown-granted and recorded claims. No underground work was done in 1961. On the surface, geological mapping and diamond drilling were done. In an area south of the adit, and another area near the south end of the peninsula on which the mine is located, thirteen diamond-drill holes were completed with a total footage of 6,416 feet.

From the end of April to the middle of August, ten men were employed under the supervision of T. W. Muraro, exploration geologist for the company.

\* By J. D. McDonald.

Company office, 626 Pender Street West, Vancouver. M. L. Craig, president. Capital: 2,500,000 shares, 10 cents par value. This Washington company was formed in September, 1948, to acquire the White Hope group of claims located alongside the highway a few miles north of Slocan City. The company also acquired the Homestake, the Senator, the Get-there-Eli, and V and M claims.

**White Hope**  
(Spokane Slocan  
Co.).

#### GWILLIM CREEK (49° 117° N.W.).\*

##### Antimony.

**Caroline Group**  
(Antimony Mines  
and Metals  
(Slocan), Ltd.).

Head office, Hutton Building, Spokane, Wash.; British Columbia office, 420 Broadway West, Vancouver; mine office, Slocan City. J. Birss, president; M. Hretchka, secretary and mine manager. Capital: 200,000 shares, 50 cents par value. This company purchased the Caroline group of seven claims from J. N. Russell, of Slocan City. The property is on the south side of Gwillim Creek, locally called Goat Creek, about 7 miles west of Slocan City. To reach the property, an old wagon-road to the base camp has been repaired and one-quarter mile of new trail has been built.

The showing consists of a quartz vein which lies in the bed of a northerly flowing tributary of Gwillim Creek. The country rock is a granite gneiss. The hillside is quite steep, and the vein is exposed along the creek-bed for a vertical height of 1,500 feet. The vein ranges in width from 2 feet to 5 feet and, where seen, appeared to be nearly vertical. Small lenses of stibnite, up to 3 inches in width, were seen in two exposures.

In 1948 work did not start until October. As the old logging-road to the property had been abandoned for many years, work was restricted to putting this in shape; a small portable compressor was used in the necessary rock-work. Snow forced a shut-down in December, but it is the company's intention to drive an adit near the bottom exposure of the vein.

#### SPRINGER CREEK (49° 117° N.E.).\*

##### Silver.

**Ottawa.**—This property was leased during 1948 to J. S. Kleman and J. J. McDonell, who mined in the vicinity of the west drift, No. 7 tunnel. The partners worked until May 1st. Production: Ore shipped, 58 tons. Gross contents: Silver, 16,395 oz.

##### Silver-Lead-Zinc.

**Arlington.** This property was optioned by B. I. Nesbitt, F. Crosby, and H. V. Dewis, who proposed to erect a mill to treat an old dump. This plan has not been carried out, but the property was leased to J. J. McDonell, who made a shipment from the dumps in September. Production: Ore shipped, 69 tons. Gross contents: Silver, 1,144 oz.; lead, 12,390 lb.; zinc, 9,803 lb.

##### Silver Leaf.

This property, which is owned by D. S. Webster, adjoins the Arlington on Speculator Creek, a tributary of Springer Creek. It was operated under lease by J. J. McDonell, who shipped ore from a dump that is reported to be ore mined in the Arlington workings and dumped on the Silver Leaf. Production: Ore shipped, 4½ tons. Gross contents: Gold, 0.02 oz.; silver, 117 oz.; lead, 973 lb.; zinc, 702 lb.

**Southern Cross**  
(Northern Light).

The Southern Cross group of six claims is a restaking of ground that was formerly covered in part by the cancelled Crown-granted Northern Light claim. The claims are at the headwaters of the east fork of Robinson Creek and are accessible from Slocan City by 2½ miles

\* By J. W. Peck.

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Gold, 0.6 oz

##### Zinc.

**Big Ledge**

\* By J. W.

## SLOCAN CITY.

**Arlington.** This property, situated on Springer Creek, about 7 miles from the main Slocan Highway, was operated under lease by F. W. Jancowski and associates for a short time during the early part of the year. A total of 202 tons of ore, chiefly sorted from the old dumps, was shipped to Trail. This yielded 5,034 oz. of silver, 7,367 lb. of lead, and 4,438 lb. of zinc. The underground workings are in very bad condition and are, for the most part, inaccessible.

Company office, 401 Sherwood Building, Spokane, Wash. C. R. Thomas, Ottawa Silver Mining and Milling Co. President; J. J. Bigger, Treasurer. Capital: 2,500,000 shares, 1 cent par; issued, 2,150,000. The company owns the Ottawa mine, on Springer Creek, about 5 miles from Slocan City. The property is equipped with a 100-ton flotation plant. The mine was operated almost continuously, under lease, by W. Hicks and associates throughout the year. Hand-steel was used to mine ore from the 8 level as well as from the old upper workings. A total of 283 tons, crude and concentrates, shipped to Trail yielded 15,991 oz. of silver. Five men were employed.

**Meteor.** This property, situated at the head of Tobin Creek, a tributary of Springer Creek, was leased by G. Larsen and C. Lindstron, of Slocan City, who mined 33 tons of ore with hand-steel and shipped to Trail. This yielded 11 oz. of gold and 3,534 oz. of silver.

## AINSWORTH.

**Krao.**—A small amount of work was done on this property under the direction of Joe Gallo. A total of 12 tons of ore shipped to Trail yielded 543 oz. of silver and 1,958 lb. of lead.

## COFFEE CREEK.

**Crescent and Eden.**—A total of 292 tons of ore, all mined in 1938, was shipped to and treated in the customs mill at Granite Siding. The concentrates were shipped to Trail.

**Olsen Group.** This property, 9 miles up Coffee Creek from the Nelson-Kaslo Highway, is owned by Alex. Grabt, of Ainsworth, and is held under lease and bond by W. Rozan and associates. Three men, using hand-steel, were employed for four months. In addition to reconditioning the old workings, 7 miles of the main trail was rebuilt and 2 miles of new trail constructed. A total of 9 tons of ore mined and shipped to Trail yielded 1 oz. of gold, 878 oz. of silver, and 1,897 lb. of lead.

## NELSON AREA.

## SALMO.

**Iron Mountain, Ltd.** Company office, 6 Royal Bank Building, Nelson, B.C. Stewart M. Marshall, President. This company operates the Emerald, on the south side of Sheep Creek, 8 miles from Salmo and 4 miles from the Sheep Creek Road. Three men, all of whom worked underground, were employed throughout the year. Hand-steel only was used. Development included 71 feet of drifting and 274 feet of crosscutting. No ore was shipped.

## CRANBROOK AREA.

Company office, 215 St. James Street, Montreal, Quebec; mine office, Consolidated Mining and Smelting Co. of Canada, Ltd. Trail, B.C. Sir Edward Beatty, Chairman; S. G. Blaylock, President and Managing Director; J. E. Riley, Secretary. Sullivan mine office, Kimberley, B.C. William Lindsay, General Superintendent. Capital: 4,000,000 shares, \$5 par; issued, 3,271,669. The company owns and operates the Sullivan mine at Kimberley. The concentrator at Kimberley treats 6,000 to 6,500 tons per day. The total output amounted to 2,091,064 tons, this exceeding the tonnage milled by 2,829, with the mine and concentrator operating 282 and 324 days, respectively. The development-work done included 4,860 feet of drifting and crosscutting, 5,280 feet of raising, and 10,164 feet of diamond-drilling. One raise, 512 feet in length, was driven to the surface from a stope in the 1-15 block.

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*Hewitt.*—This property, owned by the Galena Farm Consolidated Mines, Limited, was operated by three groups of lessees, comprising a total of eleven men headed by Ed. Mathews, E. Burke, and G. Kirk, respectively. The tonnage shipped amounted to 314 tons, with total metal contents of 5 oz. gold, 31,257 oz. silver, 130,492 lb. lead, and 67,689 lb. zinc.

*Slocan-Arlington.*—Situated on Springer Creek. The Slocan-Arlington Mines Development Company (head office, Penticton, B.C.) shipped 528 tons of ore from the dumps on this property to the Trail smelter, and yielded 3,418 oz. silver, 9,823 lb. lead, and 5,947 lb. zinc.

*Lucky Thought.*—H. V. Dewis, of Silverton, shipped 83 tons of ore from this property, which yielded 2 oz. gold, 4,564 oz. silver, 23,424 lb. lead, and 39,695 lb. zinc.

#### LARDEAU AREA.

*Spider.*—Formerly known as the *Multiplex*. On this property, situated near Camborne, exploratory and development work was carried on through the greater part of the year by I. G. Nelson and Grover Cady, of Nelson, under the direction of W. S. Harris. Eleven men were employed (six underground), this number being reduced to three for the winter months. There is no machinery on the property, but arrangements are under way to secure electric power from the *Meridian* plant, about 1½ miles away from the mine in a straight line. Ninety tons of ore shipped to the Trail smelter yielded 8 oz. gold, 6,784 oz. silver, 34,019 lb. lead, and 29,838 lb. zinc.

*True Fissure.*—Situated about 5 miles from Ferguson and operated by the New True Fissure Mining and Milling Company, Limited (head office, 800 Guarantee Trust Building, Windsor, Ontario), with Alexander H. Smith as manager, John Asher as mine foreman, and Fred Robinson in charge of the mill. Operations were begun in the spring, and the summer was largely spent in improving the road, cleaning and repairing the mine workings, completing the construction of the mill, and erecting new living accommodation. The power plant was badly damaged by a freshet in the month of August and had to be rebuilt. Mining operations began in the fall, about 50 tons being treated at the mill daily. Electric power is supplied by a 300-horse-power alternator driven by a Pelton wheel, and is transmitted to the mine at a line voltage of 2,400. A 15½-inch and 9½-inch by 8-inch Canadian Ingersoll-Rand compressor driven by a 100-horse-power C.G.E. induction-motor has been installed. The development-work done consisted of 410 feet of drifting, 50 feet of raising, and 9 feet of crosscutting. Seventy-nine tons of concentrates shipped to the Trail smelter yielded 31 oz. gold, 3,804 oz. silver, 62,747 lb. lead, and 16,216 lb. zinc.

*Silver Cup.*—Situated about 8 miles from Ferguson and operated by the Silver Cup Mining and Milling Company, Limited. Operations, begun late in 1936, have so far been limited to the construction of a small flotation-mill and of an aerial tramway 1,700 feet in length, the erection of living-quarters and the treatment of ore recovered from the mine dumps. The only underground work attempted was the cleaning of a part of No. 7 level. A total of twenty-four men were employed (all on the surface and at the mill), at first under the direction of L. C. Penhoel, and later under that of M. C. Arnold. Two hundred and nine tons of concentrates shipped to the Trail smelter yielded 229 oz. gold, 22,344 oz. silver, 73,609 lb. lead, and 66,546 lb. zinc. The recovery of the latter metal is incomplete, a high percentage of it finding its way in the tailings. Owing to the condition of the road from Ferguson, after the first heavy snowfall, operations were suspended on the 13th day of December.

#### VICINITY OF ALBERT CANYON.

*Allco Silver.*—At this property, operated by the Allco Silver Mines, Limited (head office, 708 Yorkshire Building, Vancouver), and situated on the middle fork of Silver Creek, about 12 miles north of Silver Creek Siding on the Canadian Pacific Railway, a crew of six (three underground) was employed for nearly a year under the direction of Roy D. Watson. The development-work done consisted of 65 feet of sinking, 50 feet of winze, and 115 feet of crosscutting. A total of 114 tons of ore shipped yielded an estimated 4,469 oz. silver and 86,640 lb. lead.

The ore has been stoped out above the No. 5, although there are places from which small tonnages can be mined, while further prospecting on the hanging-wall side may reveal the presence of parallel shoots. By a rough estimation the dumps contain about 25,000 tons, in which the values are bound to be "spotty." In order to arrive at an estimate of the tonnage suitable for mill-feed extensive and costly sampling would have to be undertaken. Shipments made so far have been encouraging; for instance, 700 tons shipped in 1919 averaged 19.8 oz. in silver, while another 700 tons recently treated by the mill averaged 12 oz. in silver.

The mill is on Springer creek, at an elevation of about 1,000 feet below the No. 5 tunnel. It is supplied by a 2,000-foot 2-bucket tram, the upper terminal of which is on a level with the bottom of the No. 5 dump. The rated daily capacity of the mill is 50 tons. The flow-sheet is as follows: The tram discharges into a 45-ton storage-bin; the ore is then fed over a 1-inch grizzly to a 7 by 10 Blake crusher; then to a 40-ton feed-bin, from which it is fed direct to a 5- by 22-foot tube-mill; the discharge from this goes to a drag classifier; the oversize is kept in closed circuit with the tube-mill and the overflow constitutes the feed for the flotation-machine, it being 98 per cent. minus 100 mesh. The flotation-machine is a 9-cell M.S. type. Concentrates are taken off from the first four cells; the remaining five cells make middlings which are kept in closed circuit with the machine. Tailings made in the last cell go to waste. The plant is run by water-power developed from Springer creek under a head of 290 pounds. The average power used is about 100 horse-power.

Some little delay was caused by the silex liner of the tube-mill and difficulty was experienced in getting suitable pebbles, so it was decided to insert a steel liner and replace the pebbles with steel balls. This change has resulted in increased efficiency.

The first shipment of 20 tons of concentrates was made on November 9th. This contained 308.5 oz. of silver to the ton and gave net returns of \$3,989.48. The ratio of concentration for this shipment was about 35 to 1 and the average values in the feed were 12 oz. in silver to the ton. The cost of reclamation and treatment of the dumps is estimated at \$2 a ton. The crew consists of twelve men, six of whom are employed at the mill.

This is the first attempt made in the district to concentrate this class of ore, and the results will have an important bearing on many of the properties in the "dry ore" belt.

This property adjoins the claims of the *Ottawa* group to the west and  
**Tamarack.** comprises the following claims: *Tamarack*, *Falls View*, and *Essie*. Malcolm Cameron, of Slocan, who is a part owner, has been engaged at development-work during the year. The vein occupies a sheared fissure in granite, dipping at an angle of 30° to the south and striking due east. The ore is a "dry ore" similar to that of the *Ottawa*.

In 1905 extensive drifting was done on the vein by three adit-tunnels at vertical intervals of 80 feet. The uppermost, or No. 1, has been driven, at an elevation of 4,600 feet or about 1,200 feet above Springer creek. It consists of a drift 206 feet long. The vein is continuous for the whole length of the tunnel. Recently ore was struck near the end, where the vein widens, and carries a pay-streak of from 18 to 24 inches. A composite sample taken at the face across these widths gave the following returns: Silver, 32 oz. This ore extends back into the drift for about 10 feet, when the vein becomes narrower and the filling more mixed.

The No. 2 tunnel, which is in 270 feet, only developed ore near the portal. A few car-loads were extracted from this shoot during the early history of the property and the ore was followed by a raise to the No. 1 level, above which it was continued for 45 feet. The remaining values at this point are confined to small streaks and pockets. A sample across narrow widths ran: Silver, 43.8 oz.

No ore was developed in the No. 3 tunnel, which is in about 330 feet. In this tunnel a fault-fracture was encountered. The walls are slickensided and the filling consists of crushed and decomposed granite.

The results obtained by recent work in the No. 1 tunnel are encouraging, more especially since it has recently been demonstrated that this class of ore is amenable to concentration by the flotation process. At present hand-sorting and cobbing is necessary before shipment. This is expensive, as the ore is both difficult to sort and extremely tough and hard to break.

This property is situated near the head of Springer creek at a distance of  
**Arlington.** about 8 miles by road from Slocan. It is owned by the Rithet Estate in Victoria. The claims were staked as early as 1894 by C. E. Fielding. According to the only old records available, the mine reached its apex of production in 1901, when it

headed the list of Slocan shippers with a production of 5,283 tons for the year. In 1904 the mine was temporarily closed down and reopened in 1905. Steady production was maintained until 1908. The ore shipped is reported to have averaged about 75 oz. in silver and 5 per cent. lead to the ton.

In 1918 M. S. Davys, of Kaslo, took a lease on the dumps, from which he shipped some 500 tons. The ore was not carefully sorted and the values proved disappointing. The ore, consisting of grey-copper, antimonial sulphides of silver, and a little galena, is reported to have occurred in narrow lenses, stringers, and "kidneys" throughout a crushed zone in granite having a width in places of 70 feet. In order to win this ore it was necessary to mine a large percentage of second-grade material which would not stand shipment and had to be hand-sorted. The dumps give evidence of this method having been resorted to. Failure to find a suitable method of concentration during the period of operation was probably the primary cause of closing down.

The mine was opened by three adit-tunnels—namely, A, B, and C. A level gained a vertical depth of 150 feet below C; B level was driven at 100 feet above A. The principal stoping was done between B and C levels; on the former, according to old maps, it is continuous for over 1,000 feet along the strike of the deposit. A level is caved and partly full of water. Some of the old workings are still accessible from B level, in which several small lenses of good ore are exposed.

In reviewing the data from old records it is evident that a large tonnage was produced in proportion to the amount of development-work done in the ore-bearing zone. The occurrence of ore throughout a wide zone of shearing would suggest that more crosscutting might have been done to advantage, while there is no reason to suppose that the ore pinches out below the 150-foot or A level.

For the successful operation of this property, providing sufficient ore is developed, a concentrator would seem to be a necessary adjunct. To reopen the mine with a view of again placing it on a productive basis, it would be necessary to clean out and retimber A tunnel, from which level further exploratory and development work could be carried on.

R. R. Hedley, who acquired a lease on the property this year, has been engaged in investigating such of the old workings as are accessible and sampling the dumps, which contain by a rough estimate some 10,000 tons. The results of a number of assays of ore picked from the dumps indicate that it cannot be hand-sorted profitably, as that carrying high silver values closely resembles low-grade ore, and vice versa.

This group, consisting of the *Silver Crown*, *Silver Banner*, *Silver Bugle*, *Silver Silver Crest* *Crest*, and *Silver Bell* claims, is situated along the precipitous summits on the southern side of the headwaters of Lemon creek, about 17 miles by road and trail from Kootenay lake (8 miles by the old wagon-road up 6-Mile creek from Willow Point; thence about 9 miles by trail up Lemon creek). The property can also be reached by the trail up Lemon creek from the Slocan River valley, which route is also about 17 miles in length. The claims, which are recorded in the name of H. G. Harding, secretary of the McLeod-Slocan Mining Syndicate, formerly constituted the *German* group, abandoned by the owner, Henry Reichert, when he left the country in 1916. Reichert was responsible for most of the work done on the property (chiefly open-cuts). R. G. McLeod (president of the syndicate) and associates did some work stripping the outcropping of the vein on the *Silver Crest* claim in the summer of 1921.

At the time of the writer's visit there were eight men in addition to Mr. McLeod and his family at the property. A few of the men were employed in making an open-cut in the lead on the summit of a precipitous bluff at 8,500 feet altitude. This bluff falls abruptly for 1,400 feet towards Lemon creek and the workings are reached by a roundabout route which culminates in the glacial basin behind and a few hundred feet below the summit. From the cabin at about 6,800 feet altitude it takes over an hour of stiff climbing to get to the workings.

The mineralization occurs in a fissure-vein in granite. A basic micaceous dyke follows close to the vein on the hanging-wall side. The strike of the vein conforms to the trend of the summit of the mountain (north-easterly and south-westerly) and the dip is steeply into the mountain, or south-easterly. The vein varies in width from 10 to 12 inches where exposed in the open-cut and the wall-rocks are rusty-looking and decomposed for several feet. The associated minerals are pyrite and galena carrying gold and silver values in a gangue of decomposed quartz and

made eastward to the east vein, which was drifted on to the north, until the ore chute was cut for the distance already mentioned. Until this work was accomplished, the success of the property was problematic, and as this was finished only about a year ago, the development and equipment of the property have not yet taken definite shape. Surveys and plans were, however, being prepared for a No. 6 tunnel about 200 feet lower than No. 4, which would cross-cut to the vein in a distance estimated at about 500 feet, cutting it at a point much to the south of the present workings, so that a long drift to the north will be required to get under the known ore chute.

Pending the final decision as to the location of this tunnel, the permanent equipment of the mine has been delayed, but when completed it will include an aerial tramway to the valley of Springer creek, with probably a concentrating plant of some form, and also air compressors, etc., for which purposes surveys were being made, and a location and water rights secured, a short distance below the old *Arlington* saw-mill.

In July, the greater part of the production was being made from an intermediate level or drift between levels Nos. 3 and 4, from which stopes were being raised, with a face of about 160 feet in ore, of a width of from 1 to 3 feet of first-class ore, and of a greater thickness of second-class ore. This second-class ore will probably be concentrated eventually, but will require some process other than the ordinary hydraulic concentration, as the values are largely in gray copper, finely disseminated through a close-grained, highly silicious matrix.

The present mine plant, which is temporary in character, consists of a lumber cook-house, bunk-house, sorting shed and bins, and an office, while at the mouths of Nos. 3 and 4 tunnels are cheaply constructed timber-framing sheds and a blacksmith shop, the whole equipment, as valued by the management, being worth about \$7,000. Some 48 men were last season employed underground and 13 above. The total amount of tunnelling done is about 3,500 feet, exclusive of raises, etc.

About three miles farther up Springer creek, and on the same slope as *Arlington Mines, Limited*, the last-mentioned mine, are the *Arlington* and *Speculator* properties, which have in past years made large shipments of ore, but which are now closed down, and were found to be locked up and in charge of only a watchman. These properties are on a great crushed zone some 100 to 200 feet wide, filled with talcose matter. This zone has a strike of N. 10° E. and cuts from the valley of Springer creek diagonally up the hillside into the basin at the head of Ten-Mile creek, on which the *Enterprise* mine is located, and represents a very extensive fissuring and movement in the formation.

The *Arlington* has been very extensively opened up by a series of adit tunnels, A, B, C, D, E, F, G and H, and a small shaft, while, connected with these, extensive drifting operations have been carried on in the crushed zone. The filling material of this zone is reported as being fairly firm when first opened up, but the mine has stood for some time idle, and being very wet, the weather and water have acted on the filling, converting it into a talcose clay, which completely masks the formation and any ore which might otherwise be visible.

The first-class shipping ore is reported to have been found in "kidneys" of quartz carrying gray copper and silver-lead sulphides, which occur throughout the zone, but not, apparently, with sufficient frequency to permit of the mine being worked for these alone, without utilising the second class ore, of which there is a large quantity on the dumps, separated by hand-sorting from the shipping ore. For the treatment of this second-class ore the manager, Mr. J. F. Collum, has been investigating a number of processes of concentration, and is reported as having found one applicable to the conditions, which it is expected will be installed at no distant date.

The mine is elaborately equipped with all requisites, and is provided with offices and officers' quarters, assay office, ore-sorting building and bins, stables, blacksmith shops, bunk and mess-houses, etc. When shipments were being made the ore averaged about 75 ounces of silver to the ton and about 5 per cent. lead.

The *Speculator* is on the same zone, some half-mile further to the north and up the hill, and in this the conditions are practically identical with those of the *Arlington*. The *Speculator* also is lying idle. The two properties are owned by the same people.

The Pioneer Mining Company is a comparatively recently organised Pioneer Mining Co. company, of which W. J. Wilson, of Nelson, is president, and J. W. Moffat, B. A. Sc., is managing director, and also manager of the company's mines. Although the company is new, it has acquired a number of properties which have been well-known shippers. The claims held by the company are the *Bank of England*, *Two Friends*, *Montreal*, *Black Prince Fraction*, *Slocan Prince (Black Prince)* and *Summerseith*, all Crown-granted, and the *Four Friends*, *Doirest*, *Dundee* and *Zip* mineral claims, in all some 380 acres. These properties are situated two or three miles in a direct line south of the *Arlington*, but over a low divide, in a basin at the head of the second north fork of Lemon creek, but are reached by a trail and sleigh road branching off the *Arlington* waggon road, near the Basin Hotel. The present company took possession of the properties only in the early part of this past season, and when the writer visited the properties in August, had scarcely had time to explore the old workings.

There are a number of strong leads on the various properties, somewhat faulted and difficult to trace out, and requiring careful and systematic work and surveying to unravel, but ore of high grade has been found in each of the openings, not in great quantity, very "bunchy" in its occurrence, but very persistent, and giving strong promise of a successful enterprise. The individual properties were formerly worked very much on the "rule of thumb" principle, but since the amalgamation, Mr. Moffat has gone in for a thorough and accurate system of mapping the leads, dykes, faults, etc., which should go far towards solving a complicated mining problem. The new work that was being undertaken was on the *Slocan Prince* (formerly the *Black Prince*) and on the adjoining *Black Prince Fraction*.

The country rock formation of the vicinity is a coarsely crystalline granite, somewhat cut by dykes, and faulted. The lead in which the ore occurs is essentially a crushed zone in the granite, possibly following along the line of one of the dykes, now obscured by the crushing and weathering. This zone is as wide as 35 feet in places, and is bounded by well-defined and fairly smooth walls, on which there is a distinct gouge clay. Infiltrations of silica through the lead matter have in many places rendered it quite solid again, and apparently with the silica came the mineral forming the ore, which is usually found in the hanging-wall side of the lead. The ore is quartz, carrying galena and zinc blende, with which is associated gray copper and other antimonial sulphides.

The grade of the ore is best indicated by shipments already made from the property by previous owners, who from 1900 to 1904 shipped about 225 tons, averaging gross value \$74 a ton, or net value \$64.85. The assays averaged about 132 ounces silver to the ton, 6 per cent. lead and 8.5 per cent. zinc. The present company had mined some 64 tons of ore in 1904 from below No. 1 tunnel, which averaged 177 ounces silver, 11 per cent. lead and 21 per cent. zinc. There is no appreciable amount of gold in the ore, but specimens showing native silver are found.

The underground workings here consist of No. 1 tunnel, a cross-cut 129 feet long to the lead, on which drifting to the extent of 400 feet has been done, and also sundry raises, cross-

## THE ARLINGTON.

The vein found on the *Arlington* and the *Burlington*, owned by R. Cooper and C. Fielding, of Slocan City, and located 6 miles from that place, on the north slope of Springer Creek, on the trail leading over the divide to the Enterprise mine, has attracted much attention by reason of the rich specimens of native silver found along the cracks and crevices in a zone of shattered granite, in which also are small stringers of fine-grained galena and zinc blende, the native silver evidently being deposited in this state within the region of surface influences. This zone of crushed, and more or less altered, mineralised granite, 4 to 6 feet wide, has a strike N.E. by S.W. (mag.) and dip to the N.W. 55°, and has been traced, it is claimed, through several claims. About 30 feet of tunnelling had been made on either side of a shaft, then down 55 feet on the vein, with drifts at a depth of 35 feet, of 45 feet showing this broken country rock with stringers of ore and quartz, and on the dump were piled 70 to 80 tons of ore, the value of which could not be learned as none had been shipped to the smelters. This winter the owners are continuing the development work.

## THE HOWARD FRACTION.

This was the only "dry ore" property examined, and on the south slope of the divide, or Gold Hill, between Springer and Lemon Creeks, 8 miles from Slocan City, lie, besides many other claims, the *Howard Fraction*, *Tiger Fraction*, *Altgeld*, *Deadwood*, *Bland*, and *Free Gold*, owned by A. E. Teeter, Wm. Price, V. T. Ratcliffe, *et al.*, Slocan City.

The granite is traversed by many porphyry dykes, some of considerable width, and also by quartz veins carrying argentite, or silver sulphide, and varying values in gold.

This vein, running about east and west, was dipping northerly into the mountain at a very low angle, or at a dip of 10° to 15°, and an incline had been sunk about 115 feet, but not all along the vein, as this was found to be faulted up 3 feet, and 15 feet further again faulted 8 feet along the same direction of throw, while a third fault had been struck. The vein was 12 to 20 inches wide, of honeycombed quartz, with argentite disseminated through it in crystalline form, and considerable ore had been stoped, hand-sorted, and shipped to the smelters, which returned high values in silver and good gold values, as 7 tons shipped to Pilot Bay in 1895 gave 163 ounces silver and \$16 in gold per ton, and 12 tons more recently, 206 ounces of silver and \$26 in gold per ton. This winter work is being carried on, but little has been done to develop the veins found on the other claims.

## OTHER CLAIMS.

*The Meteor*,  $\frac{1}{4}$  mile north-east of the Howard Fraction, and bonded to Jno. A. Finch and Sheran, has also a good vein of this "dry ore," which was being opened up and prospected during the last fall.

*The Silver King*, 1 mile south-east of the Howard Fraction, owned by C. Faas and M. Heckmann, has a 120-foot cross-cut tunnel heading for a vein.

The *Crusader Group*, owned by C. Faas, R. N. Clay, *et al.*, Slocan City, comprises the Crusader, Boulder, and Hidden Treasure, up the first north fork of Lemon Creek. Float having been found, trenching was resorted to, resulting in the discovery, within the walls of decomposed granite, of a vein  $2\frac{1}{2}$  feet wide of cellular, coarsely-grained crystalline quartz, with coarse particles of silver glance and iron pyrites, some native silver and gold. A shaft has been sunk 33 feet along this vein, and this autumn one-half interest was sold to W. H. Hellyar and W. H. Smith for \$12,500, and supplies were to be packed up to keep 4 or 5 men at work all winter.

*The Alpine Group*, embracing the Swiss, Highland Chief, Burn, and Kootenay Pass, is located high up on the mountain side above Summit Creek, the south fork of Lemon Creek, and has a strong gold-bearing quartz vein 2 to 3 feet wide, lying very flat, and traceable through three basins. But little work other than assessment has been done, and the owners, C. Faas, H. Cleaver, *et al.*, have lately bonded these properties to A. B. McKenzie and A. Dick, of Rossland.

The *Monument Group* of claims is located near these properties.

*The Ocean Group* is located  $3\frac{1}{2}$  miles north-east of the Crusader group, and west of the glaciers on the summit from which flow Kokanee Creek, south fork of Kaslo Creek, east fork of Ten-Mile Creek, up which runs the trail from the Enterprise mine road, and the main branch of Lemon Creek. This group of three claims lies at an altitude of over 8,000 feet, and of course above timber line, and the ledge is said to be a dyke mineralized with silver glance and